

Appl. No. 09/590,657
Amdt. dated October 23, 2003
Reply to Office action of July 23, 2003

REMARKS/ARGUMENTS

This Amendment is intended to be a complete response to the Office action of July 23, 2003 and the case is believed to be in condition for allowance. Accordingly, reconsideration is respectfully requested.

In the Drawings

The drawings filed on June 7, 2002 were objected to by the Examiner. Applicants have amended the claims. These amendments moot the objection to the drawings. Accordingly, applicants respectfully request withdrawal of the objection.

Status of the Claims

Claims 1-20 are pending in the application. Claims 1-6, 8-9, 12-14 and 16-18 were rejected in the Office action. Claims 7, 10-11, 15, 19 and 20 were objected to in the Office action. Claims 1-9, 12, and 16 are amended herein.

Allowable Subject Matter

The Examiner has indicated that Claims 7, 10-11, 15, 19 and 20 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants traverse the rejection of the rejected claims and therefore decline the invitation to rewrite the allowable claims in independent form.

The Claims

Informality in Claim 7

Claim 7 was objected to because "RMS" in line 9, page 23, was not spelled out. Claim 7 has been amended to spell out "RMS" as Root Mean Square. Additionally, page 17 of the specification has been amended to reflect the same change. A person of

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ordinary skill in the art would infer that RMS stands for Root Mean Square in this context. Accordingly, no new matter has been added.

35 USC 103

Claims 1-6, 8, 9, 12-14 and 16-18 were rejected under 35 USC 103(a) as unpatentable over various combinations of Gardner et al. (U.S. Patent Number 5,387,907) in view of Lyon et al. (U.S. Patent Number 5,838,727), Cioffi (U.S. Patent Number 5,887,032), and Gardner et al. (U.S. Patent Number 5,010,333). Applicants traverse the rejection.

Claim 1 was rejected as unpatentable over Gardner '907 in view of Lyon. "To establish a *prima facie* case of obviousness, three basic criteria must be met. ... Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." MPEP 2143.

The suggested combination of Gardner '907 and Lyon fails to meet at least the the above-quoted of these three criteria. The invention concerns adaptive far-end cross-talk cancellation. As noted in the Specification "[f]ar-end cross-talk is the interference between data transmitted in one propagation mode and the data transmitted in another propagation mode" (Specification, page 2, lines 28-30). Claim 1 has been amended to more clearly set forth this aspect of the invention, namely, by stating "an adaptive far-end cross-talk cancellation logic for canceling cross-talk that occurs between the first and second propagation modes" (Claim 1). As noted by the Examiner (Office Action, Page 2), Gardner does not discuss signal transmission on multiple propagation modes. Thus, any mention in Gardner of cross-talk cannot relate to canceling far-end cross-talk occurring between propagation modes.

The Examiner has suggested Fig. 9, element 106 of Gardner as the teaching of applicants' claimed adaptive far-end cross-talk cancellation circuit. However, this element addresses a very different problem. Gardner addresses the problem of smearing of signals as they are propagated over a long cable. Gardner '907, Col. 16, lines 1-9. Element 106 is a fractionally spaced transversal filter system used to sort out and recover individual data sequentially transmitted on the logging cable. The filter makes

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appropriate adjustments to unsmear the data. Gardner '907, Col. 16, lines 10-19. Such filtering cannot be considered "an adaptive far-end cross-talk cancellation logic for canceling cross-talk that occurs between the first and second propagation modes" (Claim 1). Lyon also does not address cross-talk cancellation between propagation modes and the Examiner has not alleged that Lyon teaches or suggests adaptive cross-talk cancellation. Thus, it follows that a combination of Gardner '907 and Lyon would fail to teach or suggest at least that element of Claim 1.

Other claims were rejected under different combinations of Gardner '907, Lyon, Gardner '333 and Cioffi. Gardner '333 discloses a telemetry system for monocable ("Advanced Digital Telemetry System for Monocable Transmission Featuring Multilevel Correlative Coding and Adaptive Transversal Filter Equalizer", Gardner '333, Title). Applicants have not found any teaching in Gardner '333 that expands the disclosure therein beyond the scope established in the title. For example, Gardner '333 states in the Abstract that "this is transmitted up the monocable to the surface" and while Gardner '333 recognizes that a cable can have multiple conductors ("the cable also can include up to seven conductors", Gardner '333, Col. 5, lines 13-15), Gardner '333 states that "the present disclosure [Gardner '333] will focus on a single electrical conductive path" (Gardner '333, Col. 5, lines 16-18). Thus, Gardner '333 addresses a problem and solution that occurs in a single electrical conductive path. For that reason, Gardner '333 would not have a need for dealing with the far-end cross-talk that occurs between multiple propagation modes. It is therefore not surprising that '333 does not teach or suggest "an adaptive far-end cross-talk cancellation logic for canceling cross-talk that occurs between the first and second propagation modes".

Cioffi addresses a different kind of cross-talk, namely, near-end cross-talk (NEXT). NEXT is a very different problem from far-end cross-talk. In near-end crosstalk cancellation, a cancellation system removes crosstalk from a known signal (the local transmitter) into an unknown received signal. This is a relatively simple problem to solve, since the crosstalk source signal is known. In far-end crosstalk cancellation, on the other hand, a cancellation system removes simultaneously crosstalk from a first unknown source signal that is received on a second signal and crosstalk from an unknown second

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source signal that is received on the first signal. This is a more difficult problem to solve, because neither signal source is known at the time of reception because the goal of canceling out this crosstalk interaction between the two received signals to recover the two unknown source signals. Cioffi explicitly states that their solution "pertains to a technique for removing crosstalk interference (e.g., NEXT interference) from received signals on a given line by adaptively estimating the crosstalk interference induced by certain other of the lines having interfering transmissions." In far-end cross-talk the interference is between two received signals, not received and transmitted signals. Thus, because Cioffi addresses a different problem, it is not surprising that Cioffi fails to teach or suggest "an adaptive far-end cross-talk cancellation logic for canceling cross-talk that occurs between the first and second propagation modes".

Thus, each of the references fails to teach or suggest at least one element of Claim 1. Accordingly, Claim 1 is patentable over the references taken singly or in combination and should be allowed. The other independent claims recite limitations analogous to those recited in Claim 1 and are patentable for the reasons given in support of Claim 1.

The various dependent claims incorporate all the limitations of their respective base claims, recited further unique and non-obvious combinations, and are therefore patentable over the cited references for the reasons given in support of the independent claims and by virtue of such combinations.

CONCLUSION

It is submitted that all the claims now in the application are allowable. Applicants respectfully request reconsideration of the application and claims and its early allowance. If the Examiner believes that the prosecution of the application would be facilitated by a telephonic interview, Applicants invite the Examiner to contact the undersigned at 512-331-3748.

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It is believed that no additional claim fees or other fees are due in connection with this Response as has been indicated on the transmittal letter. If Applicant is in error as to these fees, the Commissioner is hereby authorized to charge any fees that may be required, or credit any overpayment, to Deposit Account 19-0597.

Respectfully submitted,



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Date: 10/23/2003

Enclosures:

1. Facsimile Transmittal Sheet (1 page)
2. Transmittal Form (1 page)
3. Certificate of Transmission by Facsimile (1 page)
4. Amendment Transmittal Letter (1 page) & duplicate copy

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